

U.S. Application No.: 10/623,949  
AMENDMENT B

Attorney Docket: 3827.116

### REMARKS

Review and reconsideration of the Office Action of October 4, 2005, are respectfully requested in view of the above amendments and the following remarks. Claims 1-6 & 9-14 are currently pending. By this Amendment, claims 1-5 are amended, claims 7 & 8 are cancelled and claims 9-14 are added. No new matter has been added.

### Claim Amendments & New Claims

Claims 1-5 have been amended and claims 9-14 added. Support for each amendment and new claim may be found throughout the specification, with specific examples provided below. No new matter is added.

Claim 1 was amended to add the limitation that each indexable cutting plate included an imprint in the area of the main cutting edge to mark the individual cutting segments and that each imprinted cutting segment of each main cutting edge is associated with one of the plate receptacles. Support for these amendments can be found throughout the specification, for example in paragraphs [0019] & [0021] and Figures 3 & 4. No new matter is added.

Claims 1-3 were amended in order to consistently refer to elements 36, 36' and 36" as a cutting segments. No new matter is added.

New claim 9 is drawn to a method of relocating identical indexable cutting plates in the tool head described in claim 1. The method includes relocating the indexable cutting plates between the plate receptacles in order to use each of the imprinted cutting segments prior to disposing of the cutting plate. Support for these amendments can be found throughout the specification, for example in paragraphs [0007], [0018] & [0020]. No new matter is added.

New claim 10 is based on claim 1 with amendments made in order to bring the claim into conformity with the defining characteristics described in the previous office action. The amendments include the limitations that the cutting plates include at least three main cutting edges, that the cutting segments are non-overlapping, and that each non-overlapping cutting segment is effective with the adjustment angle associated with one of the various plate

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receptacles. Support for these elements may be found throughout the specification, for example paragraphs [0017]-[0020]. No new matter is added.

New claims 11-14 are additional aspects of the defining characteristics set forth in Amendment A. Support for these elements may be found throughout the specification, for example paragraphs [0017]-[0020]. No new matter is added.

### Claims Rejections - §102

Claims 1-3 and 5-7 are rejected under 35 U.S.C. §102(b) as being anticipated by (U.S. Patent 5,620,284 issued to Ueda *et al.* (hereinafter "Ueda"). Claim 1 has been amended to overcome this rejection.

Before reviewing the prior art, Applicants review the claimed invention as set forth in amended claim 1.

1. (currently amended) A tool head for employment in machine tools with  
a base body (12),  
a tool shank (14) projecting axially beyond the base body (12) and adapted for  
being coupled to a rotating machine spindle, and  
at least two ~~blade plate~~ receptacles (18, 18', 18'') spaced apart in the  
circumferential direction for receiving respectively one indexable cutting ~~plate insert~~ (20,  
20', 20''), such that the main cutting edge in the cutting position exhibits differing  
adjustment angles ( $\alpha$ ,  $\alpha'$ ,  $\alpha''$ ) relative to the base body axis,  
wherein identical indexable cutting ~~plates inserts~~ (20, 20', 20'') are provided in the  
different ~~blade plate~~ receptacles (18, 18', 18''),  
wherein the active main cutting edges (34) of the indexable cutting ~~plates inserts~~  
(20, 20', 20'') are subdivided along their length into at least two ~~blade cutting~~ segments  
(36, 36', 36'') in alignment with each other, and  
wherein for each of the various ~~plate blade~~ receptacles (18, 18', 18'') respectively  
only one of the cutting segments (36, 36', 36'') of the indexable cutting ~~plates inserts~~ is  
effective with the associated adjustment angle ( $\alpha$ ,  $\alpha'$ ,  $\alpha''$ ),  
wherein the indexable cutting plates are provided with an imprint in the area of  
the main cutting edge marking the individual cutting segments, and  
wherein each imprinted cutting segment in the area of the main cutting edge of the  
indexable cutting plates is associated with one of the plate receptacles.

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The claimed invention is drawn to a tool head, with multiple plate receptacles, each plate receptacle having an associated adjustment angle. Identical indexable cutting plates are provided for each plate receptacle. Each cutting plate having cutting edges with at least two cutting segments. The indexable cutting plate include an imprint in the area of each individual cutting segments & each imprinted cutting segment is associated with one of the plate receptacles. Neither imprinted cutting plates nor imprinted cutting segments associated with individual plate receptacles are disclosed or suggested by Ueda.

Ueda is concerned with wear of the receptacle or blade, and addresses the problem by providing a sacrificial spacer, such that vibration of the blade wears the spacer which can then be replaced. Ueda discloses forming two beveled surfaces in a first step and forming a third surface by sliding slider 16 along the generatrix via a coupling pin. Clearly, Ueda does not disclose or suggest the claimed elements of imprinted cutting plates or imprinted cutting segments associated with individual plate receptacles. In addition, Ueda does not disclose or suggest using an identical cutting plate for each of the plate receptacles, where each plate receptacle has an associated adjustment angle where only one of the cutting segments is effective when held at the associated adjustment angle. Accordingly, Applicants believe that claim 1 and all claims dependent thereon are drawn to allowable subject matter.

#### Claims Rejections - §103

Claim 4 is rejected under 35 U.S.C. §103(a) as being unpatentable over Ueda in view of U.S. Patent No. 4,975,002 issued to Kress *et al.* (hereinafter "Kress"). Kress is drawn to a boring tool with several cutting plates arranged on the periphery of the cutting head. The Examiner indicates that Kress discloses a claw clamp to rigidly connect a base body to a cutting insert. However, Kress does not disclose or suggest the claimed elements of imprinted cutting plates or imprinted cutting segments associated with individual plate receptacles. Accordingly, Applicants believe that claim 1 and all claims dependent thereon, including claim 4, are drawn to allowable subject matter.

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Claim 8 is rejected under 35 U.S.C. §103(a) as being unpatentable over Ueda in view of U.S. Patent No. 6,164,878 issued to Satran *et al.* (hereinafter "Satran"). The Examiner indicates that Satran is drawn to an insert having indexable cutting stations identified by numerals. Claim 8 has been cancelled; however, the rejection is overcome since claim 1 now includes the imprinted cutting segments marking different plate receptacles, each plate receptacle for forming a different feature.

The claimed invention is drawn to using identical cutting plates having multiple cutting edges, each edge having multiple, non-overlapping imprinted cutting segments. Each plate receptacle has an associated adjustment angle where only one of the cutting segments is effective when held at the associated adjustment angle. The imprinted cutting inserts or imprinted cutting segments are associated with individual plate receptacles.

Satran discloses a single indexable cutting insert with multiple imprinted cutting edges. Each of the Satran cutting edges is designed for a *single insert receptacle* for use at a single angle for making a single cut. In addition, the cutting edges in Satran have only one cutting segment, which is coextensive with the cutting edge. Clearly, neither Satran nor any other cited reference disclose or suggest the claimed elements of imprinted cutting segments or imprinted cutting segments that are associated with *individual plate receptacles*. Accordingly, Applicants believe that claim 1 and all claims dependent thereon are drawn to allowable subject matter.

#### New Claims

New independent claim 9 is drawn to

9. (new) A method for relocating identical indexable cutting plates in tool heads according to claim 1, comprising the steps of,  
providing an identical indexable cutting plates in each of at least two plate receptacles;  
relocating the identical indexable cutting plates between the various plate receptacles in a cyclic fashion according to a predetermined relocating scheme, wherein the relocating step brings into service the imprinted cutting segments of the active main cutting edges assigned to the plate receptacles.

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The claimed method allows for much extended life of each cutting plate. The cutting plate includes multiple cutting segments for the same plate receptacle and multiple cutting segments for each of the various plate receptacles. Thus, the claimed method allows the life span of each cutting plate to be at least doubled or tripled. None of the cited references, either alone or in combination, disclose or suggest this method of claim 9. Accordingly, Applicants believe that claim 9 is drawn to allowable subject matter.

New independent claim 10 is drawn to:

A tool head for employment in machine tools with

a base body (12) having an axis,

a tool shank (14) projecting axially beyond the base body (12) and adapted for being coupled to a rotating machine spindle, and

at least two ~~blade~~ plate receptacles (18, 18', 18'') spaced apart in the circumferential direction, each plate receptacle for receiving respectively one indexable cutting plate ~~insert~~ (20, 20', 20''), each plate receptacle oriented such that once an indexable cutting plate is provided into the plate receptacle a ~~[[the]]~~ main cutting edge in ~~[[the]]~~ a cutting position exhibits differing adjustment angles ( $\alpha$ ,  $\alpha'$ ,  $\alpha''$ ) relative to the base body axis,

wherein identical indexable cutting plate ~~inserts~~ (20, 20', 20'') are provided in the different ~~blade~~ plate receptacles (18, 18', 18'') and each indexable cutting plate comprises at least three main cutting edges (34, 34', 34''),

wherein the active main cutting edges (34) of the indexable cutting plate ~~inserts~~ (20, 20', 20'') are subdivided along their length into at least two non-overlapping cutting blade segments (36, 36', 36'') in alignment with each other, and

wherein for each of the various ~~blade~~ plate receptacles (18, 18', 18'') respectively only one of the non-overlapping cutting segments (36, 36', 36'') of ~~the indexable~~ each main cutting edge inserts is effective with the ~~associated~~ adjustment angle ( $\alpha$ ,  $\alpha'$ ,  $\alpha''$ ) associated with each plate receptacle, wherein a different non-overlapping cutting segment is effective with each of the various plate receptacles.

For ease of comparison to previous claim 1, claim 10 is shown above using the marked-up format. In the Office Action, the Examiner indicated that he believed that a claim including the defining characteristics outlined in the Amendment A would overcome the cited prior art. Accordingly, Applicants submit new claims 10 through 14, which include various elements of

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the defining characteristics.

The defining characteristics of the present invention include:

- (1) Identical cutting inserts are used for milling different surfaces
- (2) Each cutting insert has each cutting edge divided into at least two blade segments, each blade segment is intended to be used for cutting a different surface feature (e.g., a first segment for milling a valve seat ring, a second segment for milling an inlet protection bevel, and a third segment for producing an outlet protection bevel)
- (3) The insert receptacles have different orientations, such that when the cutting insert is placed in a first receptacle it is indexed for machining a valve seat ring, when the second (identical) cutting insert is in the second receptacle it is indexed for milling an inlet protection bevel, and when the third (identical) cutting insert is in a third receptacle, it is indexed for producing an outlet protection bevel,
- (4) The different milled surfaces are cut by different blade segments, such that when a cutting insert in the first receptacle is worn out for cutting valve seat rings, it can be moved to the second receptacle and used for milling an inlet protection bevel, and when worn from this work, can be moved to a third receptacle and used for producing an outlet protection bevel.

In new claim 10, Applicants have included the limitation that each indexable cutting plate comprises at least three main cutting edges. The main cutting edges include non-overlapping cutting segments, where a different non-overlapping cutting segment is effective with the adjustment angle associated with each of the various plate receptacles. Applicants have thoroughly reviewed the cited art and believe that none of the cited references, whether alone or in combination, disclose or suggest the invention as set forth in claim 10.

In the claimed invention, when a cutting plates becomes worn it is not expended, rather, it is either rotated and replaced in the same plate receptacle or moved to a different plate receptacle, thus the useful life of the cutting plate is doubled or tripled. Claim 10 indicates this by reciting that for each of the plate receptacles, only one of the non-overlapping cutting segments of each main cutting edge is effective with the adjustment angle associated with each

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plate receptacle and a different non-overlapping cutting segment is effective with the adjustment angle associated with each of the various plate receptacles. This limitation is missing from the references cited by the Examiner. Accordingly, Applicants believe that claims 1, 9 & 10 and all claims dependent thereon are drawn to allowable subject matter.

Ueda is concerned with wear of the receptacle or blade, and addresses the problem by providing a sacrificial spacer, such that vibration of the blade wears the spacer which can then be replaced. Unlike the claimed invention, Ueda does not disclose or suggest that a plate having multiple *main cutting edges*. In addition, Ueda does not disclose or suggest an indexable cutting plates with multiple main cutting edges, where each main cutting edge includes a distinct non-overlapping cutting segment useful in each of the plate receptacles. Accordingly, Applicants believe that claim 10 and all claims dependent thereon are drawn to allowable subject matter.

Ueda discloses forming two beveled surfaces in a first step and forming a third surface by sliding slider along the generatrix via a coupling pin. Ueda provides no suggestion for the present distinguishing claim limitation. Applicants submit that Ueda read alone provides no suggestion for the claimed invention, absent hindsight reconstruction based on reading of the present specification.

It is noted that the Examiner refers to Fig. 4 of Ueda et al for teaching that the blades are divided into at least two blade segments - contact edge and non-contact edge. However, the claimed invention requires the plates to have multiple non-overlapping (sequential) contact surfaces that are effective in different plate receptacles. This element is simply not disclosed or suggested by Ueda. Accordingly, Applicants believe that claim 10 and all claims dependent thereon are drawn to allowable subject matter.

New claims 11-14 add additional elements that are disclosed in the "defining characteristics" section of Amendment A. Applicants have thoroughly reviewed the cited art and believe that none of the cited references, whether alone or in combination, disclose or suggest the invention as set forth in claim 10. Accordingly, Applicants believe that claim 10 and all claims dependent thereon present allowable subject matter.

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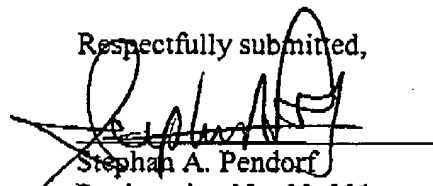
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The Commissioner is hereby authorized to charge the three month extension fee of \$1020 to Deposit Account Number 50-0951. No additional fees are believed due; however, the Commissioner is hereby authorized to charge any deficiency or credit any overpayment at any time during the prosecution of this application without specific authorization to Deposit Account Number 50-0951.

Early issuance of the Notice of Allowance are respectfully requested. Should further issues remain prior to allowance, the Examiner is respectfully requested to contact the undersigned at the indicated telephone number.

Respectfully submitted,



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Date: November 29, 2006

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